fatigue by diminishing the strain upon the hands, and is simplicity itself in construction. The same end cannot be gained by curving the handles, as proposed by Aveling and others. The object is thereby attained in part only, for whilst traction can certainly be made with curved handles more directly in the required axis, yet a change in the direction of the force can only be made by changing the hold upon the head. With the tractor, on the other hand, the direction of traction can be changed at will without changing the grasp of the blades on the head.

The forceps which I now recommend are Simpson's, modified according to the opinions stated above, and embody such changes as we can suppose Sir James Simpson would himself have adopted had he lived. The instrument is lengthened by an inch added to the shanks, and the fenestræ are increased in width on the convex side by a quarter of an inch. The changes appear trifling; but experience has convinced me that they materially enhance the usefulness of the instrument. With them I would couple the simple forceps tractor, and, so armed, I am certain the practitioner will be able to cope with any difficult case where forceps are applicable, whilst at the same time the simplicity of the instrument is retained.

ON THREE CASES ILLUSTRATIVE OF RENAL SURGERY.¹

By KENDAL FRANKS, F.R.C.S.I.,
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THE surgical treatment of stone in the kidney is of such recent date that I need offer no apology for bringing forward at this meeting of the British Medical Association three cases, the first in Ireland, in which operative measures have been resorted to. Taken together, these cases are very instructive, each of them presenting features, both in regard to their history and the results of operation, which I think are well worthy of consideration. The first case has already been published in the *Annals of Surgery* for January, 1887. It represents a case in which a stone, which when dried weighed 171.3 grains, was readily detected both by the finger and by an exploring needle through an incision in the left loin. The second case was one in which the symptoms were almost conclusive of renal calculus, and yet through a lumbar incision careful manipulation with the fingers and free use of exploratory punctures failed to reveal the presence of a stone. In this case the kidney was not incised. The third case was one in which exploration with the finger and exploring needle also failed to detect a stone, and yet, after a free incision was made into the substance of the organ, a small calculus lying in an abscess cavity was found to exist. These cases, then, are typical cases of the varying conditions which may confront the surgeon in his search after a stone in the kidney; and as they open up several practical fields of thought, I will shortly sketch the history of each.

The first case was that of a man, aged 28, a silk weaver by trade, on whom I operated on May 6th, 1886, for stone in the left kidney. The history of this condition dated back for about six years. He had previously enjoyed good health, but had been a heavy ale-drinker. In the winter of 1879-80, during one of his drinking bouts, he had rigors, followed by a feverish attack, and a fortnight later suppression of urine, which lasted three days. When the urine was again secreted it was passed mixed with blood. Concurrently with the hæmaturia severe and paroxysmal pain came on. It began in the left groin and hip, and sometimes shot down into the left testicle. Though varying in intensity, it was continuous during the six years previous to operation. The hæmaturia did not entirely cease for three months. When admitted to hospital the urine contained pus. I had him under observation for over six months. During this period he never passed blood, but the amount of pus was variable, sometimes amounting to a third. The urine was always acid, though sometimes extremely fetid. The specific gravity was about 1017. The microscope revealed pus cells and crystals of uric acid, but there were no pyriform cells and no tube casts. On examination of the site of pain nothing abnormal could be detected but well-marked tenderness over the last rib and below it, immediately external to the erector spinæ, that is, over the region of the left kidney. He could not lie on the right side without increased pain. My colleague, Dr. Wallace Beatty, who examined the case with great care, concurred entirely

in the view I took of it, and accordingly I operated in the usual way, choosing the lumbar incision. When the kidney was reached a hard mass could be felt in the pelvis, and an exploratory puncture with a long needle showed that this was a calculus. It was about two inches in length, and completely filled the pelvis. An incision two inches long was made through the substance of the kidney down to the stone. The hæmorrhage at first was very brisk, but a finger passed through the wound served as a plug, and it quickly became checked. The stone was friable and chalky, but was so firmly embedded in the pelvis that it had to be crushed with a forceps and removed piecemeal. Part was hooked out with the finger and part with the assistance of a lithotomy scoop. The *débris* were washed out by means of irrigation. A drainage-tube was placed external to the kidney and brought out at the lower angle of the wound. The incised parts healed by first intention, excepting along the track of the drainage-tube, which was not finally closed till between the fourth and fifth week. After operation he was able to lie on the right side, and since he left hospital has been able to resume his work, which he had been obliged to give up entirely. He is now in good health, although the urine still contains a small amount of pus.

The second case was that of a farmer, aged 40, on whom I operated on February 24th, 1887. His renal history dated back to an accident he met with in August, 1885. A horse kicked him in the right groin; he fell backwards, striking his left side and back against a heap of stones on the road. He was stunned for a few minutes, but, on recovering, he experienced a sharp pain over the two last ribs on the left side. About a week later he noticed that the act of micturition caused him pain, which was most acute at the glans penis. It was increased in frequency, and was often followed immediately by the passage of a few drops of blood. These symptoms lasted for a fortnight, and then he was more or less free from them till September, 1885, when the hard work of the harvest brought them all back again. They continued without improvement till he came under my care. He then complained of pain over the left kidney, of a dull aching character, and continuous. It was increased by lying on his back or on his left side, or by exertion. It shot down into the left groin and into the penis, especially if he experienced a jolt. There was tenderness on pressure over the region of the left kidney. The urine was pale in colour and cloudy; it contained a small quantity of pus, and occasionally a little blood; it was acid, with a specific gravity of 1020; the microscope showed some renal cells, but no tube casts.

As some of the symptoms pointed to the possibility of a vesical calculus, he was sounded twice for stone, the second time under chloroform, but nothing abnormal could be felt except an increased rugosity of the lining membrane of the bladder. I therefore made an exploratory lumbar incision, and exposed the left kidney. I pressed it carefully all over between my fingers, but beyond an apparently thickened condition of the pelvis, I was unable to detect the presence of any stone. The kidney was then punctured systematically with a long needle, but nothing was found. I accordingly closed the wound, which healed rapidly, union being complete in a week, and he was then allowed to return home. Six weeks later I heard that he had returned to the country in "fairly good spirits and health, and that he had not much urinary trouble." But at the end of this period he got a chill from exposure, with high fever, rapid pulse, and he soon became delirious; but during the attack the urinary symptoms were not aggravated. He died on April 15th, the gentleman who attended him not having been able to arrive at a diagnosis as to the cause of death. It does not however appear to have been in any way connected with the renal trouble or with the exploratory operation. I should add that the pain in the side was materially improved by the operation, no doubt the result of the division of some of the nerves.

Though operation in this case failed to detect the stone, as has happened in many other cases, I have not hesitated to communicate it, as it forms a strong contrast with the third case, in which similar difficulties were encountered. This was the case of a married woman, aged 34, who was admitted to the Adelaide Hospital on February 16th, 1887. In 1869 she suffered for about a year from anæmia, but subsequently she enjoyed good health up to January, 1885. In the meantime she had married and had become the mother of four children. She became pregnant for the fifth and last time in May of that year. In the preceding January (that is, 1885), she began to suffer from a burning pain, not very severe in the region of the right kidney. It was accompanied by

¹ Read in the Section of Surgery at the Annual Meeting of the British Medical Association, held in Dublin, August, 1887.

profuse diarrhoea. At the end of three days she was seized with severe stabbing pain in the same situation, almost causing her to faint. Similar paroxysms occurred subsequently, while in the intervals between these paroxysms the burning pain continued. All these symptoms were aggravated during the months of pregnancy, which terminated prematurely at the eighth month in the birth of a stillborn child. This was in December, 1885. Immediately after this occurrence she experienced a new pain in the right side of the abdomen of a gnawing character. She referred this to a point about midway between the anterior superior iliac spine and the umbilicus of the right side. These symptoms were present when she was admitted to hospital. During her stay in hospital previous to operation she had frequent attacks of the paroxysmal pain, beginning at the back over the right renal region, and shooting through to the front under the right costal arch, "as though a needle were being driven through from behind." This pain radiated across the abdomen, and more lately passed down to the hip, sometimes posteriorly, sometimes in front and down to the inside of the thigh. When an attack came on she used to coil herself up in bed and writhe with the pain. It was always accompanied by nausea and by vomiting if she had taken food shortly before. Since her last confinement menstruation had taken place fortnightly, lasting for eight days, and during these periods the pain in the abdomen was aggravated. On examination it was found that tenderness on pressure was marked in the back over the two last ribs and below them, but nowhere else in the neighbourhood. Anteriorly, where she complained of the abdominal pain, a swelling with its long axis vertical could be felt, tender to the touch and scarcely movable. It was difficult to determine what this tumour was; it felt in shape like a kidney, but it felt longer and occupied a distinctly lower position than that of the normal organ. The increased pain during the menstrual periods gave rise to the idea that it might be a diseased ovary.

The urine, which was frequently examined during her stay in hospital, nearly always presented the same characters. It was acid, of normal specific gravity, and contained no albumen, pus, or blood; but after standing a short time a well-marked deposit of oxalate of lime was invariably seen. Under the microscope numberless crystals were found, mostly octahedra, but sometimes ovoids and dumb-bells. Occasionally a deposit of amorphous lithates was thrown down. In addition to these might be seen vaginal epithelium and a few cells resembling pus corpuscles.

Dr. Wallace Beatty, who took a very great interest in the case, and who rendered me much valuable assistance, considered that it was a case in which operative measures should be adopted; and this view was also held by my other colleagues. Accordingly I performed the operation of nephrolithotomy on April 5th, 1887. I used the lumbar incision, about five inches in length. When the muscular layers had been divided, I found the lumbar aponeurosis was adherent to the peri-renal fat, and that it required some trouble and patience to clear the anterior surface of the kidney. The posterior surface was readily freed. The first thing which attracted special notice was a depression about the centre of the convex border of the kidney, which presented the appearance of a stellate cicatrix, but beyond a slight thickening of the renal substance beneath it, nothing could be felt to account for this. The kidney occupied a distinctly lower position than usual, and was decidedly longer than the normal, and I have no doubt but that this was the swelling which was felt through the abdominal wall previous to operation. There was absolutely nothing to be felt of an abnormal kind in the renal pelvis. As I could easily draw each part of the kidney in turns up to the lumbar incision, I carefully passed each portion through my fingers, but I could detect no hardness or inequality to guide me as to the position of a calculus. Exploratory punctures made seriatim in every direction likewise failed to give any clue. Under these circumstances I determined to make the exploration complete by incising into the kidney substance, as otherwise the only alternatives left to us would have been either to leave her unrelieved, or to excise, as Mr. Morris has done, an otherwise healthy organ. I began by making an incision about an inch and a half long, with the cicatricial depression as the central point, along the convex margin. The hæmorrhage at first was very brisk, and took some time and pressure to arrest. This incision reached down to the pelvis. With my finger passed into it, I felt about in all directions, but without success. I then got a probe-pointed and grooved director, and passing it into the wound in the kidney, explored in several directions. Suddenly it slipped upwards

into what was evidently a small abscess cavity, and some pus came along the groove of the director. A small calculus, about the size of a pea, was distinctly felt lying in the cavity. I now passed a knife along the groove, and by means of an extension of the wound upwards for about an inch, I laid the abscess cavity freely open. The amount of pus contained in it was about half a drachm. The wound now bled freely, and as pressure seemed to have little effect, I irrigated it with weak corrosive sublimate solution, which in a few minutes controlled it to a great extent. Unfortunately, the fluid washed out the stone, and before I could examine the returned fluid it had been thrown out. However, we succeeded in finding two or three very fine spiculæ. As the oozing from the kidney substance was still free, I thought it best to plug the renal wound lightly with a piece of antiseptic gauze wrung out in weak carbolic solution, the end of the gauze being brought out at the angle of the skin wound beside the drainage tube. The parts were sutured in successive layers, and the wound dressed with gauze and a turf mould pad. For two days after the operation the patient suffered from incessant vomiting, which nothing seemed to check. She was nourished entirely by nutrient enemata. She had had no return of the spasmodic pain—that is, the renal colic, but the prostration from the vomiting caused me some uneasiness. On the morning of the third day, having tried every medicinal expedient I could devise, it occurred to me that the vomiting might be reflex from the kidney, and might be due to the plug which I had put in to stop the bleeding, much in the same way as nausea is so generally an accompaniment of renal colic. I accordingly at once removed the plug by gentle traction, with the happy result that vomiting only occurred once subsequently. From this time she made rapid progress. The wound remained aseptic throughout, and healed by first intention. The urine continued to flow along the track of the drainage-tube for four weeks, and a fortnight later the patient returned to her home in Holyhead. She completely got rid of the pain in the back and abdomen, and had no return of it when last I heard of her. I believe she is now in perfect health. When she left hospital she had regained flesh and colour, and looked a different woman.

This case is interesting in many ways, and I think it is one also of considerable importance. When Mr. Henry Morris excised an otherwise healthy kidney, and found in it a small calculus hidden away in one of the calices—which on a previous occasion he had been unable to detect, either by digital exploration or by needle puncture through a lumbar incision—he suggested that it might be better practice to open up the kidney and explore the calices rather than to sacrifice a healthy organ. This advice has been unfavourably criticised in some quarters, but I venture to say that this case goes to prove the wisdom of the suggestion. Had I not cut into the kidney, I must have resorted to the more dangerous expedient of nephrectomy, or have been satisfied to leave my patient *in statu quo*; and I believe that the exploratory incision is by far the safest alternative. The result in this case makes me regret that I did not resort to it in the second case.

Another point which this case emphasises is that, to arrest the hæmorrhage from the kidney, should it prove difficult of control, it would be better to compress the edges of the wound together by plugs applied external to the kidney, rather than by leaving any foreign body in the substance of the kidney itself. Taking these cases together, it will be seen that the only symptoms common to all three are the pain and the localised tenderness. In forming a diagnosis, the condition of the urine may act as a guide, but the absence of blood or pus from it is not to be depended on as indicative of the absence of a stone.

ILLUSTRATIONS OF THE ORTHOPÆDIC APPARATUS, REFERRED TO AT A DEMONSTRATION OF MODERN ORTHOPÆDIC METHODS.¹

By NOBLE SMITH, F.R.C.S. Ed.,

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THE points chiefly urged in regard to the use of instruments were as follows:

1. Determination by the surgeon himself as to the kind of instrument to be used, if any.

¹ Read in the Section of Surgery at the Annual Meeting of the British Medical Association held in Dublin, August, 1887.